

## بحث بعنوان

التحديات القانونية المرتبطة بالرحلات الفضائية الخاصة شبه المدارية

مقدم من الطالبة

الشيخة / ميره أحمد راشد المعلا

المسجلة لدرجة الماجستير في القانون العام – كلية القانون – جامعة الشارقة

تحت إشراف

الأستاذ الدكتور

شير عباس

أستاذ القانون – كلية انون – جامعة الشارقة

## **The Legal Challenges of Suborbital Private Space Tourism**

### **Abstract**

This article delves into the realm of private suborbital space tourism, a burgeoning concept frequently used to describe journeys beyond Earth's atmosphere undertaken by paying passengers merely for pleasure and excitement. Traditionally, space tourism primarily revolved around orbital space tourism, with Dennis Tito's visit to the International Space Station (ISS) in 2001 as a milestone. However, space tourism comes in various forms, ranging from extended stays at orbital facilities to brief orbital and suborbital spaceflights and intercontinental point-to-point rocket transportation. Given the absence of a tourist destination in space aside from the ISS, it is increasingly likely that the industry will kick off with suborbital human spaceflights.

Currently, private space travel stands at the same juncture as aviation in its early days, needing more legal clarity and requiring new regulations. Legal clarity is crucial to the prosperity and growth of the space tourism industry, considering the flux of private companies entering the market and offering suborbital spaceflights to paying customers. This article attempts to address some of the critical legal issues related to suborbital human spaceflight, including the lack of authoritative definitions, the choice of law dilemma, and the legal status of space tourists.

**Keywords:** Private Suborbital human spaceflight, Space tourism, Space law, Air law, Space tourists.

**عنوان البحث:** التحديات القانونية المرتبطة بالرحلات الفضائية الخاصة شبه المدارية

## ملخص البحث:

تتناول هذه المقالة العلمية الألغاز والتحديات القانونية المرتبطة بالسياحة الفضائية الخاصة، وهي مفهوم ناشئ يعبر عن سفر الإنسان إلى الفضاء لأغراض المتعة والترفيه. ازدهرت فكرة السفر للفضاء بعد رحلة رجل الأعمال الأميركي دنيس تيتو (Dennis Tito) لمحطة الفضاء الدولية في عام 2001، ليصبح أول سائح فضاء. وتطورت صناعة السياحة الفضائية منذ زيارة تيتو لتظهر أشكال متنوعة ومختلفة تتباين من إقامات ممتدة في منشآت مدارية إلى رحلات فضاء خاصة مدارية (Orbital Spaceflights) وشبه مدارية (Suborbital Spaceflights) واستخدام الصواريخ للسفر من نقطة إلى نقطة على الأرض (Intercontinental Point-To-Point Rocket Transportation). ونظراً للتكلفة العالية لهذا النوع من الأنشطة وعدم وجود وجهات سياحية في الفضاء غير محطة الفضاء الدولية، من المرجح أن تزدهر هذه الصناعة الناشئة بانطلاق الرحلات الفضائية البشرية الخاصة دون المدارية (Suborbital Private Human Spaceflights).

يشبه الوضع القانوني الراهن لقطاع السياحة الفضائية الخاصة وضع قطاع الطيران في بدايته، حيث يفتقر للتنظيم القانوني ويحتاج للمزيد من الوضوح القانوني والتنظيمي؛ ذلك أنه أمر بالغ الأهمية وضروري لازدهار ونمو قطاع السياحة الفضائية، خاصة مع تزايد عدد الشركات الخاصة التي تقدم رحلات فضائية شبه مدارية للأفراد مقابل مبلغ مادي ليعيشوا تجربة السياحة في الفضاء. تتناول هذه المقالة بعض القضايا القانونية الحرجة المتعلقة برحلات الفضاء البشرية شبه المدارية، بما في ذلك عدم وجود تعريفات موثوقة، ومشكلة اختيار القانون، والوضع القانوني لسائحي الفضاء.

**الكلمات الدالة:** الرحلات الفضائية البشرية شبه المدارية الخاصة، السياحة الفضائية، قانون الفضاء، قانون الجو، سائحي الفضاء.

## 1. Introduction

Dennis Tito's historic trip to the International Space Station (ISS) as a tourist in 2001 marks a revolution and ground-breaking milestone in human endeavors in the final frontier. This event catalyzed a shift towards increased commercialization and privatization of space, disrupting the traditional dominance of state actors in space activities (Failat, 2012, p.121). In the early days of space exploration, only a handful of nations or their agencies, occasionally aided by

intergovernmental organizations, were eligible to launch, operate, and control space objects. Private companies played secondary roles as manufacturers. However, the space landscape has evolved; private companies are now entering the space exploration scene as primary actors equal to their state-owned counterparts. The disparity between the beginning of the space age and the current era as to the nature of the space race challenges the predominant legal regime governing outer space, which is centred around states. The drafters of international space law treaties five international treaties, named as Outer Space Treaty (OST, 1967), Rescue Agreement (RA, 1968), Liability Convention (LC, 1972), Registration Convention (Convention on the Registration of Objects Launched into Outer Space) (RC, 1975) and Moon Agreement (MA, 1979) primarily had governmental space activities in their mind. Large scale commercial and private space activities were not envisaged when drafting these treaties, triggering ongoing discussions about the need to adapt existing space laws to fit today's very different realities (Ferreira-Snyman, 2014, p. 2).

Private enterprises play a pivotal role in advancing the space tourism sector. The incredible technological strides of companies like SpaceX, Virgin Galactic, Blue Origin, and Bigelow Aviation to make commercial space travel possible and accessible to people will eventually lead to more space tourism flights and more tourists venturing into space (Freeland, 2005, p. 6-9). These companies are developing commercial space travel capabilities and working towards making space travel more accessible and affordable to the average person, compared to Tito's \$20 million tourist flight to the ISS. They are driving efforts to reduce the cost of space travel to below \$200,000 and possibly \$35,000 within the next decade (Padhy & Padhy, 2021, p. 269).

The 21<sup>st</sup> century promises irresistible offers for individuals to visit outer space as tourists and explore this new frontier, which has been for so long exclusive to astronauts (Hoe, 2015, p.73). In the first era of human spaceflight, all individuals involved in space missions were astronauts serving public space agencies rather than private individuals contracting for transportation services (Von der Dunk, 2013, p. 203). The excessive involvement of private companies in the space sector due to technological maturity increases the risk of making decisions that breach or contradict established international space agreements. Nowadays, more governments are authorizing private companies to undertake space activities; that being the case, appropriate regulation must be agreed upon to handle potential legal conflicts that will inevitably arise (Freeland, 2010, p. 28).

The dramatic changes to the spacefaring landscape spurred by the advent of private human spaceflights raise the fundamental question of how to effectively regulate these new types of space activities, particularly suborbital human spaceflights. Suborbital spaceflights are flights that do not reach or are not designed to reach Earth's orbit. Given the absence of a tourist destination in space aside from the ISS, it is increasingly likely that suborbital spaceflights will become a reality in the foreseeable future, for they are less technologically demanding and more affordable. However, these flights fall into a regulatory gap between aviation and space regulations (Von der Dunk, 2019, p. 5). Different arguments have been proposed concerning the laws applicable to suborbital journeys, given that they occur in airspace and outer space.

## **2. Methodology**

Primary and secondary data collection methods were used to collect reliable data and information. The research study is based on a thorough examination and analysis of relevant sources of law,

including primary and secondary sources of international and national laws. In addition, secondary data from previously published studies will be utilized to highlight the gaps in the existing frameworks governing outer space activities and the key legal issues facing the emerging industry. Data from old and recent studies is examined to assess the evolution of knowledge on the topic so far. The advantage of gathering information through secondary analysis is that it gives a clear and precise picture of where current research stands and aids in developing ways to bridge the gaps in the present body of knowledge.

Scientific progress has sparked debate among politicians and jurists. To research and study the use of outer space, as these discussions contributed And interests in formulating ideas related to space, despite the great disagreement and division in Opinion on issues related to space law, since space law is a branch of International law has its own rules A legal entity that arises through various sources that essentially contributed to the crystallization of the basic material of The rules and regulations governing the use and exploration of this field and the source from which It issued the basic principles that states or international organizations cannot bypass when carrying out their activities in This field, and the study will discuss the legal regulation of spaceflight. Orbitality in international law.

The study will address the legal problem of orbital spaceflight through the following points: Definition issue:

- defining basic concepts .
- Determine the choice of law for suborbital spaceflight .
- Legal status of space tourists

### **3. Literature Review**

The trend toward profit-driven private space tourism poses new legal challenges, raising concerns about how well the current

international legal frameworks would cope with the changing dynamics of space exploration spurred by the private space race. Private space travel is currently at the same juncture as aviation in its early days, lacking legal and regulatory clarity and requiring new solutions and regulations (Yun, 2009, p. 964). The complex reality of private space tourism and human spaceflights has complicated the question of their regulation. This issue has been a topical and vital topic of discussion for decades because these activities challenge the existing legal framework as rather vague and seemingly outdated (Ryzhenko & Halahan, 2020, p. 84). Therefore, it becomes incumbent on the existing legal frameworks to develop and mature to address the critical legal aspects of this emerging industry. A coordinated effort by governments, international organizations, and the private sector is necessary to establish a comprehensive regulatory framework for this emerging industry (Kumar, 2021, p. 40). Legislation needs to be established to provide the necessary legal clarity and certainty to make private space travel sustainable and accessible to all (Freeland, 2010, p.4).

As the suborbital private space tourism industry advances to become a significant aspect of space exploration and commercial ventures, there is a growing need for specific regulations catering to its unique characteristics. The legal grounds for suborbital private space tourism are based on principles derived from various UN international space agreements and soft laws. International law assumes a crucial role in regulating suborbital private human spaceflights (Freeland, 2010, p.3). It recognizes the role of private entities in space and requires that they operate within the framework established by the Outer Space Treaty (OST).

The OST is a fundamental agreement laying down the foundational structure for international space law. It articulates the core principles

governing the utilization and exploration of outer space, including the principle that outer space is open for exploration and utilization by all states. It prohibits states from claiming sovereignty over space and requires that they act in a way that do not harm or interfere with other states. Moreover, the treaty establishes states' responsibility for the activities of their citizens and companies in outer space. It states that countries must grant authorization and maintain ongoing supervision of non-government space activities to ensure their compliance with international law. Consequently, private companies must adhere to these principles, obtaining authorization and undergoing ongoing supervision to prevent harmful interference with other nations (Ferreira-Snyman, 2014, p.29).

Under Article VI, the OST obliges states to authorize and maintain ongoing supervision over all their activities in outer space, including those carried out by private entities, thereby establishing equal accountability for both public and private endeavors (1967). States are internationally responsible and liable for private activities to the same extent as the activities of their space agencies, as long as they are qualified to be national activities. Considering their inherent national characteristics, private space tourism ventures may be deemed national activities under Article VI of the OST (1967). Thus, states need to retain the tools required to ensure efficient monitoring and control of such activities, including a licensing system, procedures for supervising such activities, and provisions on liability reimbursement and insurance obligations (Von der Dunk, 2006, p. 93-99). Under the current legal regime, private space activities are permissible and shall be governed within the framework of national space legislation. The enactment of national space legislation is the mechanism by which private entities are linked to the international framework governing activities in outer space.



In practice, regulating suborbital private human spaceflights is primarily the responsibility of national regulatory agencies. Consequently, answers to the legal issues associated with private space tourism flights fall within the scope of national space legislation as they are considered a subset of private space activities (Von der Dunk, 2019, p.3). It is thus self-evident for states planning to get on the space tourism bandwagon and offer private commercial human spaceflights to establish national legislation or adapt and expand the scope of their existing legislation to this end. Some countries, such as the United States and Russia, have already established regulatory frameworks for such flights, while others have yet to develop a comprehensive regulatory regime (Von der Dunk, 2013, p.201).

It is noteworthy that while international law provides a general framework for suborbital private space tourism, there may be variations in how countries interpret and implement such laws, without prejudice to international rules. The legal aspects of suborbital private space tourism activities are not covered by international law, as they fall under the purview of national space legislation. Each country has the authority to establish its unique legal framework to oversee such activities within its jurisdiction (Polkowska, 2021, p. 174-176).

The 2004 US Commercial Space Launch Amendment Act (CSLAA) is the first national space legislation to address various aspects of private commercial space activities, including regulations for private human spaceflight. It constitutes a landmark effort in promoting the private space tourism industry, thus, constitute an ideal benchmark for later efforts (Hobe, 2007, p. 441). It has served as a model and reference point for subsequent developments in space laws and regulations, both in the United States and internationally, as other countries and organizations have sought to adapt and expand their own legal frameworks to accommodate the evolving dynamics of

commercial space utilization.

Much of the legal disputes and controversies compounding the regulation of private human spaceflights stem from the absence of authoritative definitions of key concepts, which constitute a fundamental issue upon which all other issues are to be addressed. The lack of binding definitions has resulted in creative local interpretations of international norms and divergent legislative approaches at the national level, which is detrimental to the prosperity and growth of the space tourism industry (Padhy & Padhy, 2021, p. 271).

#### **4. The Definitional Issue: Defining Key Concepts**

The definitional issue is a significant challenge facing the space tourism industry, as it involves a wide range of activities and experiences that can be difficult to categorize. This issue can have significant implications for regulation and lead to regulatory uncertainty. The lack of consensus on universally accepted definitions of key terms and concepts makes establishing a clear and practical legal framework for such activities difficult. The initial approach to solving the legal dilemmas concerning suborbital private space tourism regulation is to address this issue.

Technological advances create new commercial opportunities that challenge the legal frameworks and regulations developed for earlier, less complex times. As space activities become more commercialized and transportation options expand due to advances in space technology, the choice of law question becomes more complex. Having multiple potential definitions for a single term can lead to inconsistency in regulations, potentially leading to regulatory gaps or overlaps (Dempsey & Manoli, 2017, p.2).

One approach to determining the appropriate legal regime for suborbital spaceflights is determining the type of vehicle under

consideration - whether an aircraft, a spacecraft, or an aerospace vehicle. However, no universally embraced definition exists for any of these terms, making it challenging to categorize suborbital vehicles. Some definitions focus on the altitude or location of the experience, i.e., where the vehicle at issue is, while others focus on the purpose and functional characteristics of the vehicle. There are two approaches to addressing the issue of the legal framework applicable to suborbital spaceflights: the functionalist and spatialist approaches. The former investigates the vehicle's purpose, whereas the latter focuses on its location if it is in airspace or outer space. Yet, the boundary that separates airspace from outer space is still undetermined (Dempsey & Manoli, 2017, p. p.3).

Though suborbital spaceflights have been developing for several decades, a degree of legal uncertainty remains concerning the legal and regulatory framework that applies to suborbital vehicles. Legally defining suborbital flights involves questioning whether they take place in airspace or outer space and whether the vehicle used is an aircraft or space object (UNCOPUOS, 2022). The answers would determine whether suborbital flights would fall under air law, space law, or both. The International Civil Aviation Organization (ICAO) defines suborbital flights as flights reaching extremely high altitudes without involving the launch of vehicles into Earth's orbit.

If suborbital vehicles are categorized as space objects, they would most likely be governed by space law throughout their journey. On the other hand, if they are categorized as aircraft, they would be governed by air law regardless of their location (Dempsey & Manoli, 2017, p. 11). Unfortunately, neither of these regimes provides precise definitions of the terms aircraft, airspace, space objects, and outer space. Such definitional failures create legal uncertainties and conflicts between these two legal regimes (Dempsey & Manoli, 2017, p.4-9).

International space law agreements did not define what a space object is. Nonetheless, it is commonly defined as a man-made vehicle launched or intended to be sent to space. Spacecraft do not rely on air like aircraft; they move in outer space without depending on the air, i.e., external oxygen, and they use their own power sources to escape velocity from the Earth's surface (Monahan, 2008, p.25).

In Annex 7 of the Chicago Convention of ICAO defines aircraft as “any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface” (Chicago, 1944). Accordingly, an aerospace vehicle launched by a rocket may not be classified as an aircraft during its ascent phase but could be categorized as one during its descent, as it would rely on its wings for gliding to its intended destination (Dempsey & Manoli, 2017, p. 14).

The delineation between airspace and outer space remains a topic of ongoing debate and controversy, with no universal consensus regarding the precise definition of both spheres. In general, outer space encompasses the entirety of the universe, extending beyond Earth's atmosphere, particularly areas where human endeavors are feasible. Airspace is the area or portion of the atmosphere controlled by the underlying state, extending from the Earth's surface to a certain altitude defined by that particular state. It is through the concept of sovereignty that both spheres are delineated. While airspace is an area that falls under state sovereignty, outer space is not subject to sovereignty claims (Ferreira-Snyman, 2014, p. 9-11). Article 1 of the Chicago Convention contends that states retain complete and exclusive sovereignty over the airspace above their territories (1944). In contrast, Article II of the OST explicitly states that no nation can claim or assert sovereignty over outer space (1967).

A customary international law has emerged, recognizing the Von

Kármán line at approximately 100 kilometers above sea level as the legally significant threshold for outer space (Ferreira-Snyman, 2014, p.10). However, various international agreements and national laws have proposed alternative altitudes, ranging from 80 kilometers to 160 kilometers, further complicating the matter (Sgobba & Gupta, 2022, p.1). The definition and delineation between airspace and outer space are crucial for determining the appropriate legal framework for suborbital spaceflight. Unfortunately, there is still no consensus at the international level regarding the precise commencement of outer space. With the imminent rise of suborbital space tourism activities, the necessity for a well-defined boundary between airspace and outer space has become increasingly evident (Freeland, 2010, p.10).

## **5. Determining the applicable law for Suborbital Spaceflights**

There has been some controversy about how far airspace extends above the Earth's surface. Previous attempts and efforts at designating a formal boundary between outer space and airspace have been stifled mainly for political and strategic considerations, considering states' sovereignty over their national airspace. However, the space tourism industry continues to develop notwithstanding the uncertainties spurred by this boundary issue. Different theories and arguments have been proposed regarding the law that should apply to suborbital private human spaceflights, which, as aforementioned, take place in airspace and outer space (Ferreira-Snyman, 2014, p. 12). Developing all-encompassing international treaty to address all aspects of space tourism travel, orbital and suborbital, would require considerable time and effort. However, in the interim, the choices of law available are either air law, space law, or a combination of both (Freeland, 2010, p.13).

The primary challenge in regulating suborbital spaceflights is that they lay in a gray area between traditional aviation and orbital

spaceflights. In principle, the laws governing space ventures, aviation, and high-risk adventure tourism activities are currently being considered, wholly or partially, for regulating specific aspects of suborbital private human spaceflights (Von der Dunk, 2013, p.208). Currently, there is no legal consensus on the status of suborbital spaceflights. International law does not arrive at any conclusions or provide a definitive stance on whether air or space law should be applied to such activities. During a suborbital spaceflight journey, the vehicle reaches a very high altitude, traversing airspace, and reenters the atmosphere before achieving orbit around Earth. Though pragmatic, applying two legal regimes to a single suborbital journey is unsatisfactory and impractical, especially where there is no clear boundary separating airspace and outer space. The laws governing airspace and outer space are distinct, consisting of different, incompatible rules and principles. Such distinction will naturally create greater legal uncertainty and conflict concerning jurisdiction, liability for damage, and the legal position of travelers, i.e., space tourists, particularly in the event of an accident. Therefore, it seems illogical to apply air law to part of the suborbital flight and space law to another (Freeland, 2010, p.12).

Scholars like Masson-Zwaan and Freeland argue that applying multiple legal regimes to the same space tourism flight is impractical and illogical (Ferreira-Snyman, 2014, 14). They suggest the application of space law to the entirety of the suborbital space tourism voyage as an interim solution to the choice of law dilemma. They argue that the legal framework applied to suborbital flights should be determined based on something other than the functionalist and spatialist theories, as both depend on a well-defined boundary delimiting airspace and outer space (Ferreira-Snyman, 2014, p.9-16). This approach undermines the functionalist and spatialist approaches.

The spatialist viewpoint considers the vehicle's location the prime determinant of the legal framework that should be applied to suborbital spaceflights, whether in airspace or outer space. Accordingly, depending on the vehicle's location, the suborbital journey might be subject to two different legal regimes. This approach suggests applying air law to the suborbital journey taking place in airspace and applying space law to the portion occurring in outer space. However, given the absence of a defined boundary between airspace and outer space, this theory might be of little assistance (Kumar, 2021, p. 43).

On the other hand, the functionalist theory places less emphasis on the location criterion and more on the vehicle's functions and the purpose it serves. Functionalists advise the application of one legal regime for suborbital spaceflights considering the nature and intent of the activity, irrespective of its location (Kumar, 2021, 43). They argue that if the purpose of the suborbital flight is inherent to aviation, air law will adhere to the entire journey. However, if the activity serves space-related purposes, space law will apply, even if the flight passes through airspace (Masson-Zwaan, 2010, p.264).

Functionalists investigate the purpose of the activity, the vehicle's design and licensing requirements, and its degree of interaction with other aircraft or spacecraft to determine the appropriate legal regime for suborbital spaceflights. During a suborbital spaceflight, the vehicle primarily operates within airspace after spending a few minutes in outer space. In cases of earth-to-earth transportation, aiming to link two distinct locations, air law shall prevail as airspace is the main center of the vehicle's activity. Whereas during earth-to-space transportation, as in the case of suborbital private human spaceflights, the activity will most likely be subject to space law (UNCOPUOS, 2018).

While the vehicle's location seems disconnected from its legal

categorization under the functionalist view, Masson-Zwaan and Freeland argue otherwise. They contend that identifying the limits of airspace and outer space is necessary to determine the activity's purpose and whether it is an aviation or space activity. As aforementioned, Masson-Zwaan and Freeland propose applying space law throughout all phases of the suborbital spaceflight. They suggest developing a special guideline under the auspices of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) to supplement the existing treaties. They argue that this guideline should be classified as soft law, signifying that it lacks the capacity for legal enforceability. However, it may provide the premise of a legally binding instrument for space tourism in the future. Soft law instruments, though non-binding, hold legal significance due to their profound impact on influencing the international law-making process, paving the way for the development of a comprehensive treaty that is legally binding (Freeland, 2005, p.5).

The rationale behind Masson-Zwaan and Freeland's approach stems from the pressing need for legal certainty to address the legal complexities surrounding space tourism. Developing a soft law guideline offers the best interim measure to regulate the legal aspects of space tourism activities, as it could be implemented instantly, not requiring state ratification. Soft law instruments are of political and moral value, as non-compliance would adversely impact states' reputations. Therefore, states are encouraged to align their national laws with soft law guidelines (Ferreira-Snyman, 2014, 9-16). Such guidelines constitute the first step toward creating a legally binding treaty.

## **6. The Legal Status of Space Tourists**

The legal status of space tourists has been a subject of ongoing debate and contention and a pressing issue as the notion of commercial



space travel for recreational purposes gains momentum. The rise of private space companies offering space tourism experiences to paying customers has raised questions about their legal status, such as their rights and responsibilities, liability, and jurisdiction issues. However, international space law treaties were designed to regulate the travel of astronauts and personnel of spacecraft to space, not referring to or catering to space tourists (Ryzhenko & Halahan, 2020, p. 86-87). Only astronauts' interests were considered when drafting such treaties, which primarily focused on addressing the activities and concerns of states, international organizations, and their astronauts in space. The interests of space tourists were irrelevant at the time (Freeland, 2005, p. 10-11).

The legal status of space tourists is often addressed indirectly within existing international and national legal frameworks, given the absence of an internationally accepted legal framework specifically dealing with aspects of private space tourism. Space tourists' legal stance depends on how they are defined, for it significantly influences the determination of their rights and obligations. However, there have been continuous debates about whether the term "space tourist" falls under the ambit of the terms "astronaut" and "personnel of spacecraft" mentioned in international space law treaties. Space tourists are not astronauts or spacecraft personnel, as their journeys to outer space are driven by personal interests rather than the common good and interests of humanity (Yun, 2009, 978-979).

The current framework of international space law does not define any of the terms astronaut and personnel of spacecraft, resulting in varying interpretations and differing opinions regarding the legal position of space tourists (Failat, 2012, p. 122). Accordingly, ambiguity exists as to space tourists' eligibility for the privileges and responsibilities granted to professional astronauts and personnel of

spacecraft under international space law. The OST recognizes astronauts as “envoys of mankind.” The Rescue Agreement mentions astronauts in the title and preamble but employs a broader term throughout the text, personnel of spacecraft. This term covers broad categories of people aboard the spacecraft. However, no precise definitions exist for these terms under international space law. Technically, astronauts and personnel of spacecraft are not equivalent terms (Yun, 2009, 978). Each term bears different connotations. For instance, astronaut conveys a scientific or explorative connotation, personnel of spacecraft is more functional, and envoy of mankind is more humane (Hobe, 2007, 454-455).

The lack of a clear definition gives rise to numerous questions concerning the privileges and immunities prescribed for astronauts and personnel of spacecraft and whether they would be available for space tourists. From a legal standpoint, the eligibility of space tourists for the status of astronauts hinges on two key elements: training and altitude. That said, determining the intensity level of the training space tourists should undergo to qualify as astronauts is quite challenging. Likewise, the altitude element is difficult to determine due to the unresolved ambiguity concerning the altitude separating airspace from outer space. Meeting the requirements of training and altitude can make space tourists eligible for the status of astronauts. Yet, it is arguable whether space tourists aboard a suborbital spaceflight only experiencing glimpse of weightlessness would qualify to be astronauts (Failat, 2012, p. 124-126).

An alternative approach to identifying space tourists is to classify them as personnel. A broader interpretation of the term personnel of spacecraft can broaden its application to encompass passengers, not just those actively engaged in spacecraft operations. Consequently, space tourists would be subject to the rights and obligations of the

Rescue Agreement as personnel of spacecraft and would therefore be entitled to protection and immunity. The Rescue Agreement is “prompted by sentiments of humanity,” thereby arguably applying to all persons on board suborbital spaceflights, including tourists (Kumar, 2021, p.45). Also, the OST refers to personnel in Article VIII, asserting that the intention is not to exempt any passenger from being under the state of registry’s jurisdiction and control (Yun, 2009, p.980).

Moreover, classifications provided by the Inter-Governmental Agreement (IGA) and the related Multilateral Crew Operations Panel Agreement (MCOP Agreement) for crew and passengers traveling to the ISS may influence the legal position of space tourists. Such classifications and distinctions are regarded as a trendsetting if not a standard for the industry. According to the ISS Agreements, crewmembers are qualified personnel who are either astronauts or spaceflight participants. Astronauts are individuals selected and rigorously trained and employed by governments or intergovernmental agencies for public missions. Spaceflight participants encompass a wide range of individuals involved in commercial, scientific, or other space endeavors; they could be crewmembers of non-partner space agencies, educators, scientists, engineers, journalists, filmmakers, and tourists, serving under short-term contracts. A further distinction exists between expedition or increment crewmembers and visiting crewmembers (Hobe, 2007, p.457). Expedition or increment crewmembers form the primary crew responsible for carrying out planned activities during an increment on the ISS. Visiting crewmembers include the non-expedition crewmembers traveling to and from the ISS, who may be designated as visiting scientists, commercial users, or tourists with limited roles and responsibilities (Hoe, 2015, 74-75).

Similarly, the CSLAA defines crew and spaceflight participant. The

Act defines a crew as an individual employed by a licensee or transferee, or by a contractor or subcontractor of a licensee or transferee. These crewmembers perform tasks directly linked to the launch, reentry, or operation of a launch or reentry vehicle that carries human beings. In contrast, spaceflight participants are individuals who are not considered part of the crew but are passengers aboard a launch or reentry vehicle (Failat, 2012, p.127).

The ISS IGA and the CSLAA influence space tourists' legal position as a pertinent instrument of international law and an instrument of national law, respectively. However, it is noteworthy that the distinction between astronauts and spaceflight participants provided therein does not imply a distinction in the extent of jurisdiction exercised over them. As long as space tourists are classified as personnel, they would be entitled to avail of the rights and privileges accorded to astronauts and personnel of spacecraft. The primary objective behind such classification is to ensure tourists' protection and regulation under international space law (Ryzhenko & Halahan, 2020, p. 86-87).

The legal status of space tourists is further complicated as international law favors the interpretation of treaty terms in good faith in light of their ordinary meaning and due regard to the treaty's purpose and drafters' intentions at the time as stipulated in Article 31 of the Vienna Convention on the Law of Treaties (1969). In the Concise Oxford English Dictionary, the ordinary meaning of an astronaut is an individual trained for traveling on board a spacecraft, and the term personnel refers to persons working for an organization or engaging in an arranged endeavor. Such interpretations view astronauts and personnel as crew, people with formal responsibilities and duties related to the vehicle's operation. A good faith interpretation of the term astronaut and personnel excludes space tourists. However, though

space tourists are not crewmembers in the strictest sense, they undergo some formal training, exceeding the standard aviation safety briefing provided to passengers. Therefore, adopting an inclusive interpretation of these terms covering all persons aboard the spacecraft is more reasonable and practical. Reference to the term personnel throughout the various space treaties supports adopting the broader definitions of astronauts and personnel of spacecraft to include space tourists (Cheney, 2019, 6-7).

## **7. Conclusion:**

The evolution of space exploration from a realm dominated by state actors to one marked by increased commercialization and privatization has presented unprecedented challenges to the existing legal frameworks governing outer space activities. The journey initiated by Dennis Tito's to the ISS in 2001 marked a turning point, catalyzing a shift toward private enterprises playing primary roles in space exploration.

As private companies such as SpaceX, Virgin Galactic, Blue Origin, and Bigelow Aviation make significant strides in advancing space tourism, the legal landscape faces the critical task of adapting to the changing dynamics of the industry. The existing international space law treaties, formulated with governmental space activities in mind, now confront the need for revision to accommodate the surge in private and commercial space ventures.

The emerging suborbital private space tourism sector, characterized by flights not reaching Earth's orbit, presents a unique regulatory challenge. The absence of a dedicated tourist destination in space, apart from the ISS, amplifies the need for clear legal frameworks governing suborbital journeys. The regulatory gap between aviation and space regulations further complicates the matter.

The research underscores the significance of international space law in regulating suborbital private human spaceflights. The OST establishes the foundational principles for international space law, emphasizing the openness of outer space for exploration by all states and holding them accountable for the activities of their citizens and companies in space. However, challenges arise in implementing these principles, especially as private space activities evolve.

The study emphasizes the need for a well-defined boundary between airspace and outer space to address the choice of law dilemma. The current legal uncertainty surrounding suborbital spaceflights, which traverse both airspace and outer space, necessitates a pragmatic and comprehensive solution. The debate between applying air law, space law, or a combination of both remains unresolved, leading to potential conflicts in jurisdiction, liability, and the legal standing of space tourists. The study reveals the need for a standardized and internationally recognized definition of key concepts related to private space activities. The lack of precise definitions has led to varied interpretations of international norms and divergent legislative approaches at the national level, hindering the growth and prosperity of the space tourism industry.

The definitional challenge surrounding critical concepts in the space tourism industry poses a significant hurdle, introducing regulatory uncertainty and potential gaps in oversight. The absence of universally accepted definitions for terms such as aircraft, spacecraft, and aerospace vehicles complicates establishing a clear legal framework for suborbital private space tourism. The ongoing debate between the functionalist and spatialist approaches to determine the legal regime further adds to the complexity, exacerbated by the undefined boundary between airspace and outer space. As technological advancements propel suborbital spaceflights into reality, the lack of consensus on the

commencement of outer space becomes increasingly problematic.

To address these challenges, the study encourages fostering international collaboration. Information sharing between countries with established frameworks and those in the process of development is crucial. Ongoing legal reviews are paramount, ensuring that regulations evolve alongside the rapid technological advancements in the space sector. National space legislation emerges as a crucial mechanism for regulating suborbital private space tourism, with countries such as the US and Russia already having established comprehensive regulatory frameworks. The 2004 US CSLAA serves as a landmark example, providing regulations for private human spaceflight and influencing subsequent developments in space laws globally.

Recommendations for addressing these challenges include fostering international collaboration to develop universally accepted definitions for key terms, particularly those related to suborbital spaceflights. The creation of a soft law guideline, as proposed by scholars like Masson-Zwaan and Freeland, under the UNCOPUOS, emerges as a viable interim solution. Such guidelines, while lacking legal enforceability, can serve as a foundation for a future legally binding treaty and provide immediate clarity to the evolving space tourism landscape. By implementing these recommendations, a collaborative, informed, and adaptive approach can be taken to regulate the emerging industry, ensuring its sustainability and accessibility while upholding international legal principles.

The research underscores the importance of ongoing international dialogue to harmonize regulations and establish a consistent legal framework for suborbital space tourism. States and relevant international bodies are encouraged to actively participate in the development of comprehensive regulatory guidelines that align with

the dynamic nature of the space tourism industry. This collaborative effort should involve sharing best practices, experiences, and insights to create a coherent global approach to regulating suborbital human spaceflights.

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